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•DISCOVER THE

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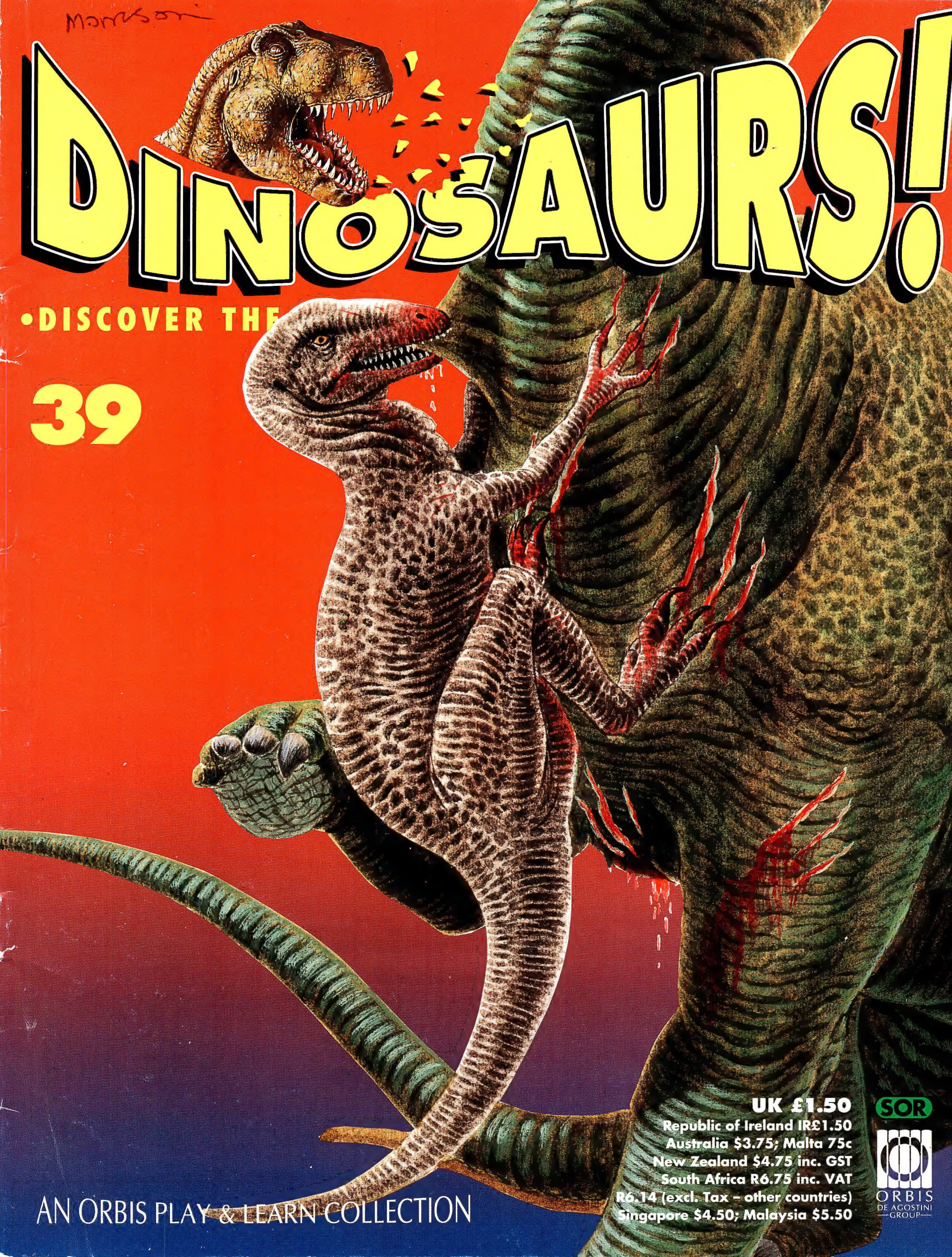

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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •

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Meet a new enthralling, mind-boggling dino trio

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DROMAEOSAURUS

When fierce *Dromaeosaurus* went hunting in deadly packs, not even the biggest dinosaurs were safe.

Dromaeosaurus was one of the fastest and more intelligent of the predatory dinosaurs. It moved swiftly and took huge leaps like a kangaroo, powered by its strong hind limbs. Its light bones and long legs helped *Dromaeosaurus* outrun slower dinosaurs.

FLICK-KNIFE BLADE

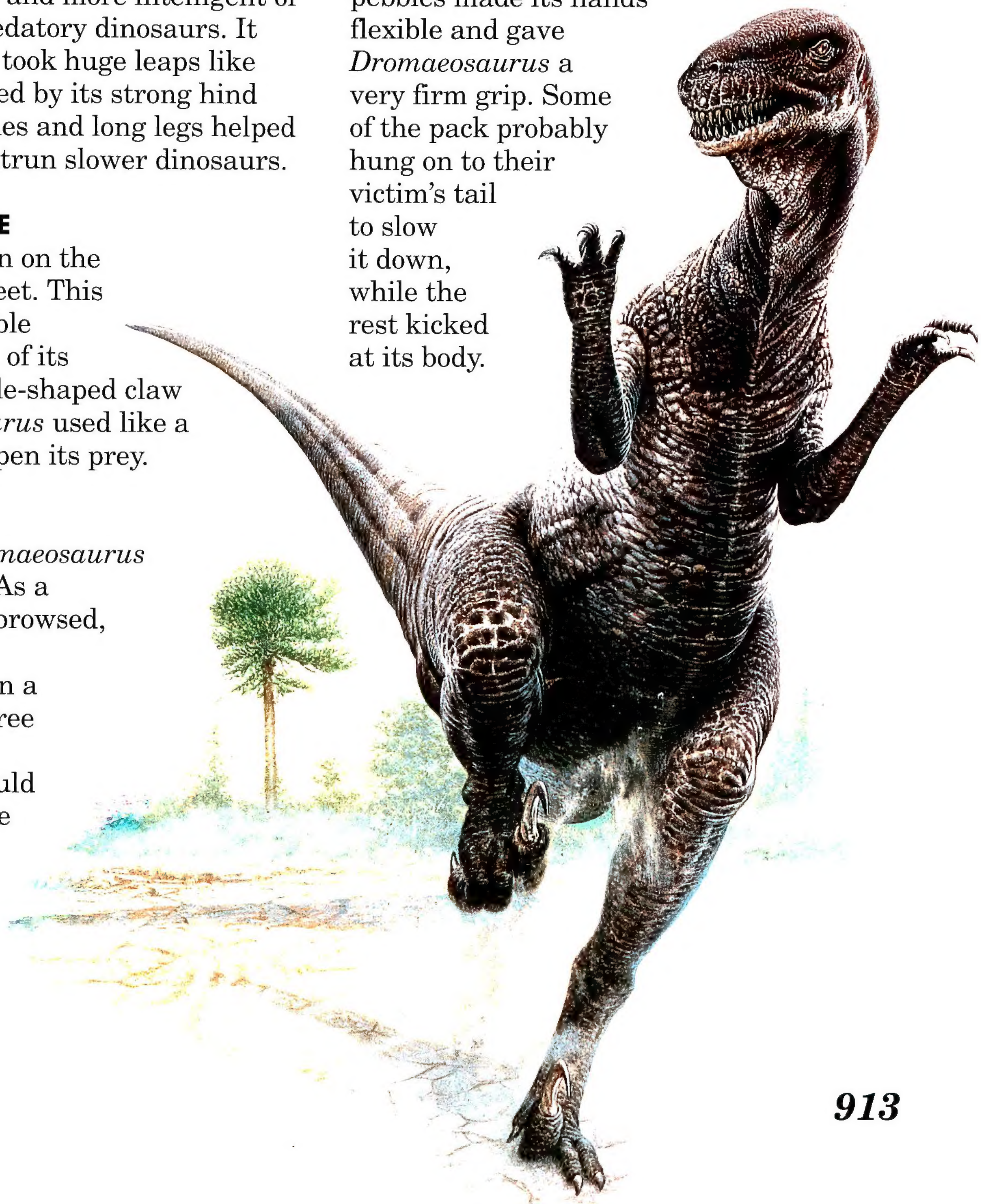
Dromaeosaurus ran on the outer edges of its feet. This protected the terrible weapon on the end of its second toe – a sickle-shaped claw which *Dromaeosaurus* used like a flick-knife, to rip open its prey.

PACK HUNTER

Experts think *Dromaeosaurus* hunted in groups. As a young plant-eater browsed, a stealthy group surrounded it. Even a dinosaur two or three times larger than *Dromaeosaurus* could be weakened by the pack's slashing blades. The victim would be unable to shake off its fast-moving attackers before they killed it.

HANGING ON

Dromaeosaurus used the three long, clawed fingers on each hand like a pair of grappling hooks to hang on to its prey. Meanwhile its toe-claws did their deadly work. Small wrist bones shaped like pebbles made its hands flexible and gave *Dromaeosaurus* a very firm grip. Some of the pack probably hung on to their victim's tail to slow it down, while the rest kicked at its body.



WIDE EYED

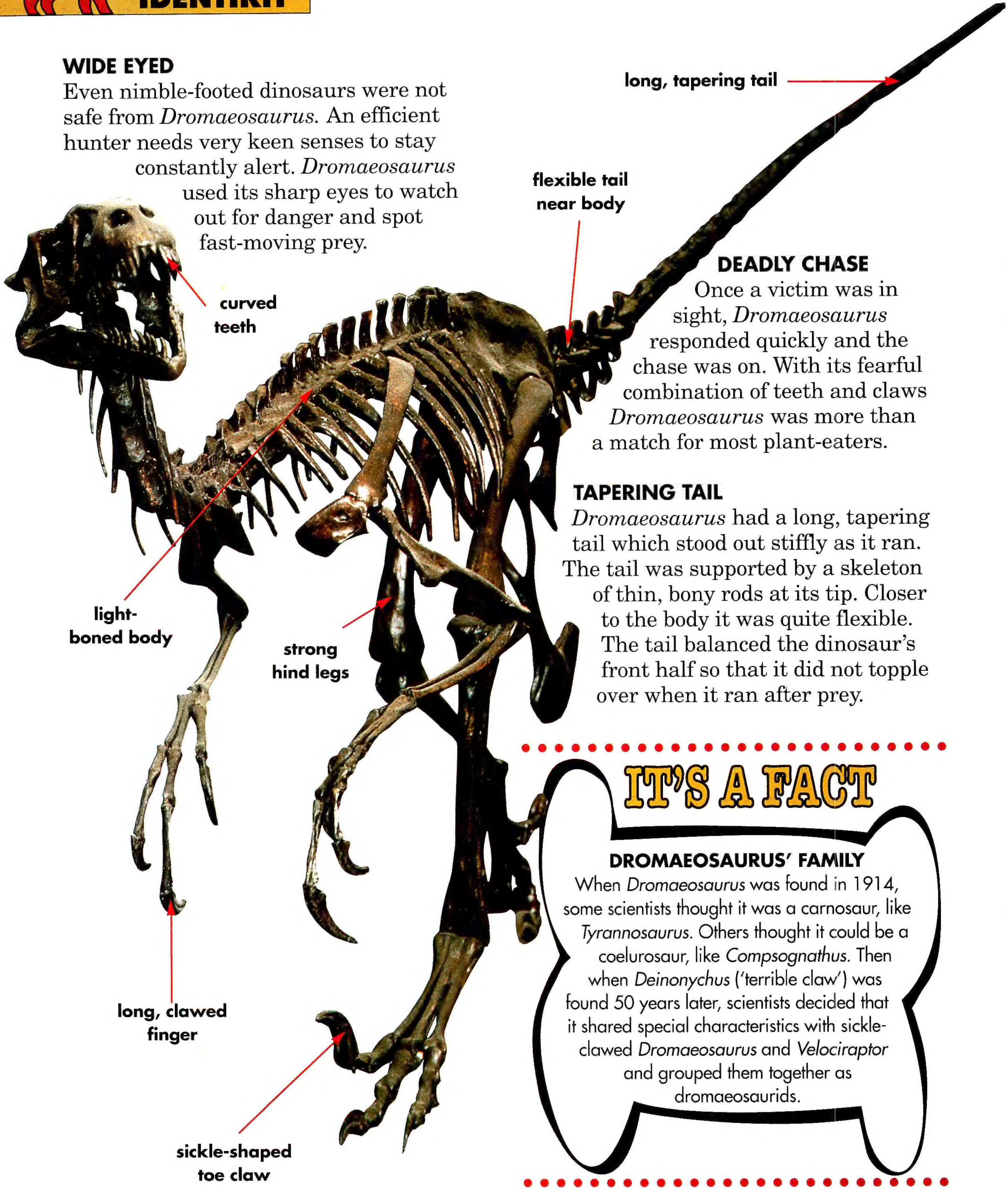
Even nimble-footed dinosaurs were not safe from *Dromaeosaurus*. An efficient hunter needs very keen senses to stay constantly alert. *Dromaeosaurus* used its sharp eyes to watch out for danger and spot fast-moving prey.

DEADLY CHASE

Once a victim was in sight, *Dromaeosaurus* responded quickly and the chase was on. With its fearful combination of teeth and claws *Dromaeosaurus* was more than a match for most plant-eaters.

TAPERING TAIL

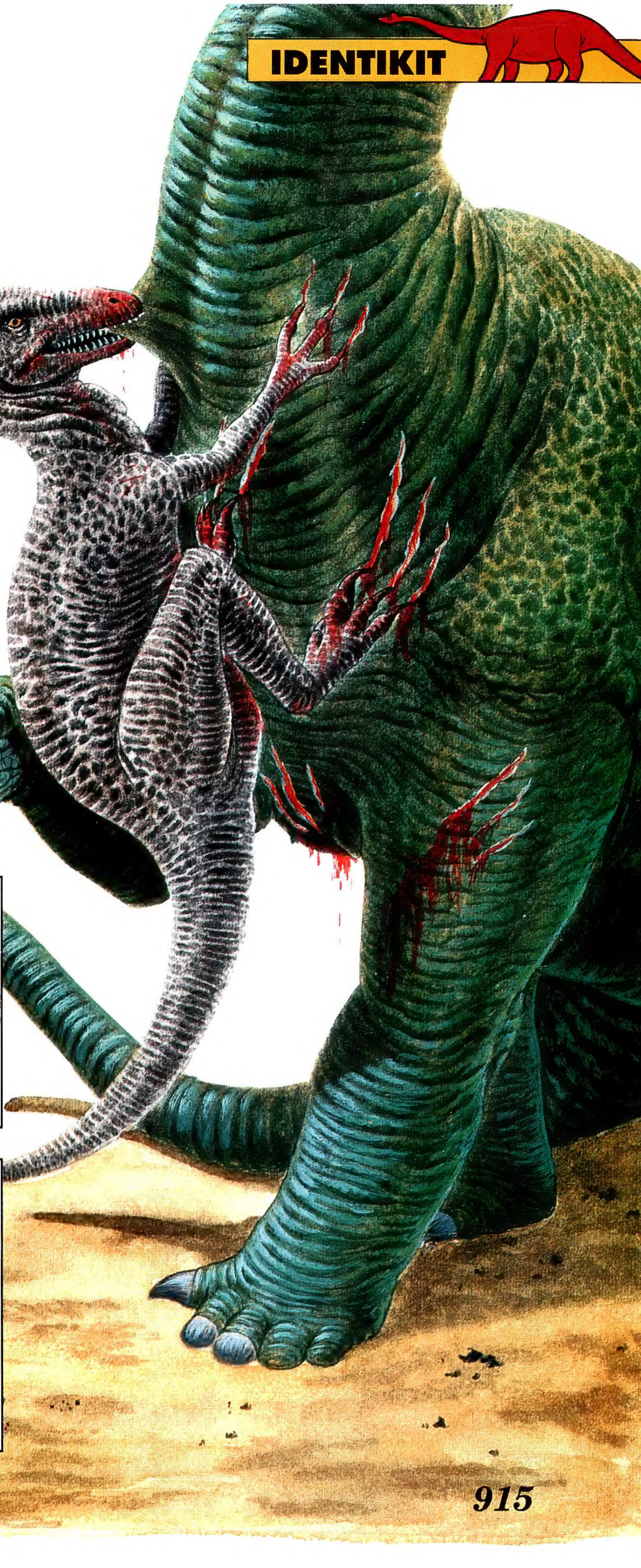
Dromaeosaurus had a long, tapering tail which stood out stiffly as it ran. The tail was supported by a skeleton of thin, bony rods at its tip. Closer to the body it was quite flexible. The tail balanced the dinosaur's front half so that it did not topple over when it ran after prey.



IT'S A FACT

DROMAEOSAURUS' FAMILY

When *Dromaeosaurus* was found in 1914, some scientists thought it was a carnosaur, like *Tyrannosaurus*. Others thought it could be a coelurosaur, like *Compsognathus*. Then when *Deinonychus* ('terrible claw') was found 50 years later, scientists decided that it shared special characteristics with sickle-clawed *Dromaeosaurus* and *Velociraptor* and grouped them together as dromaeosaurids.



NEW DIRECTION

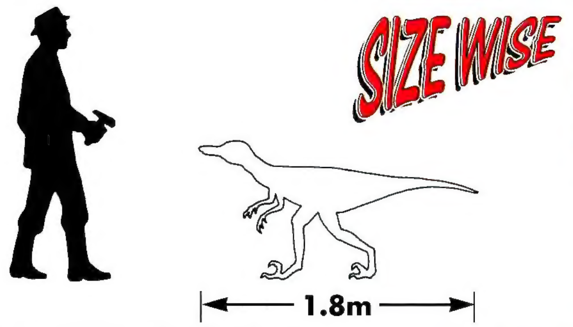
Some experts think that *Dromaeosaurus'* tail may have had another purpose. When it was running after prey, it needed to be able to change direction suddenly without stopping. By swinging its tail to one side *Dromaeosaurus* could turn its body around very quickly.

STRONG SNAPPER

Dromaeosaurus had a deep, rounded snout and strong, muscular jaws. It opened its mouth wide and snapped it shut with great force, trapping large chunks of its victim's flesh.

CURVED TEETH

Like other carnivores, *Dromaeosaurus* had sharp, curved teeth which slanted backwards. They worked like anchors so the flesh of its victim was torn away with just a few sharp tugs.



MONSTER FACTS

- **NAME:** *Dromaeosaurus* (drome-ee-oh-saw-rus) means 'running reptile'
- **SIZE:** about 1.8m long
- **FOOD:** meat
- **LIVED:** about 80 million years ago in the Late Cretaceous Period in Alberta, Canada

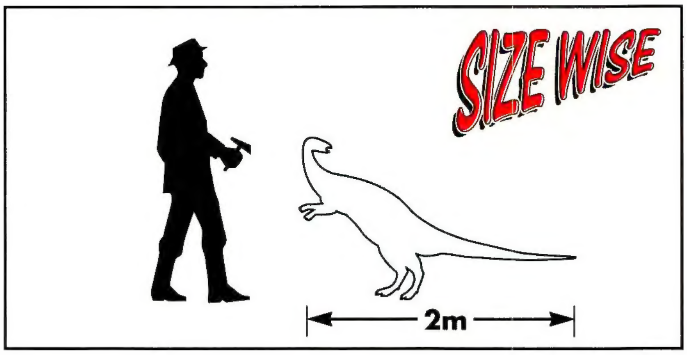
EMAUSAURUS

Mysterious *Emausaurus* was an early armoured dinosaur about the same length as a wolf.

Emausaurus may be related to *Scelidosaurus*, a dinosaur from Charmouth, southern England, which lived at about the same time. Only *Emausaurus'* skull has been found, so it has been difficult for scientists to create an accurate picture of it.

HEAVY WEIGHT

Emausaurus was about half the size of fully-grown *Scelidosaurus*. It walked on four chunky legs and had broad feet to support the weight of its heavy body. It held its tail out behind as it searched the Early Jurassic landscape for tasty shoots.



MONSTER FACTS

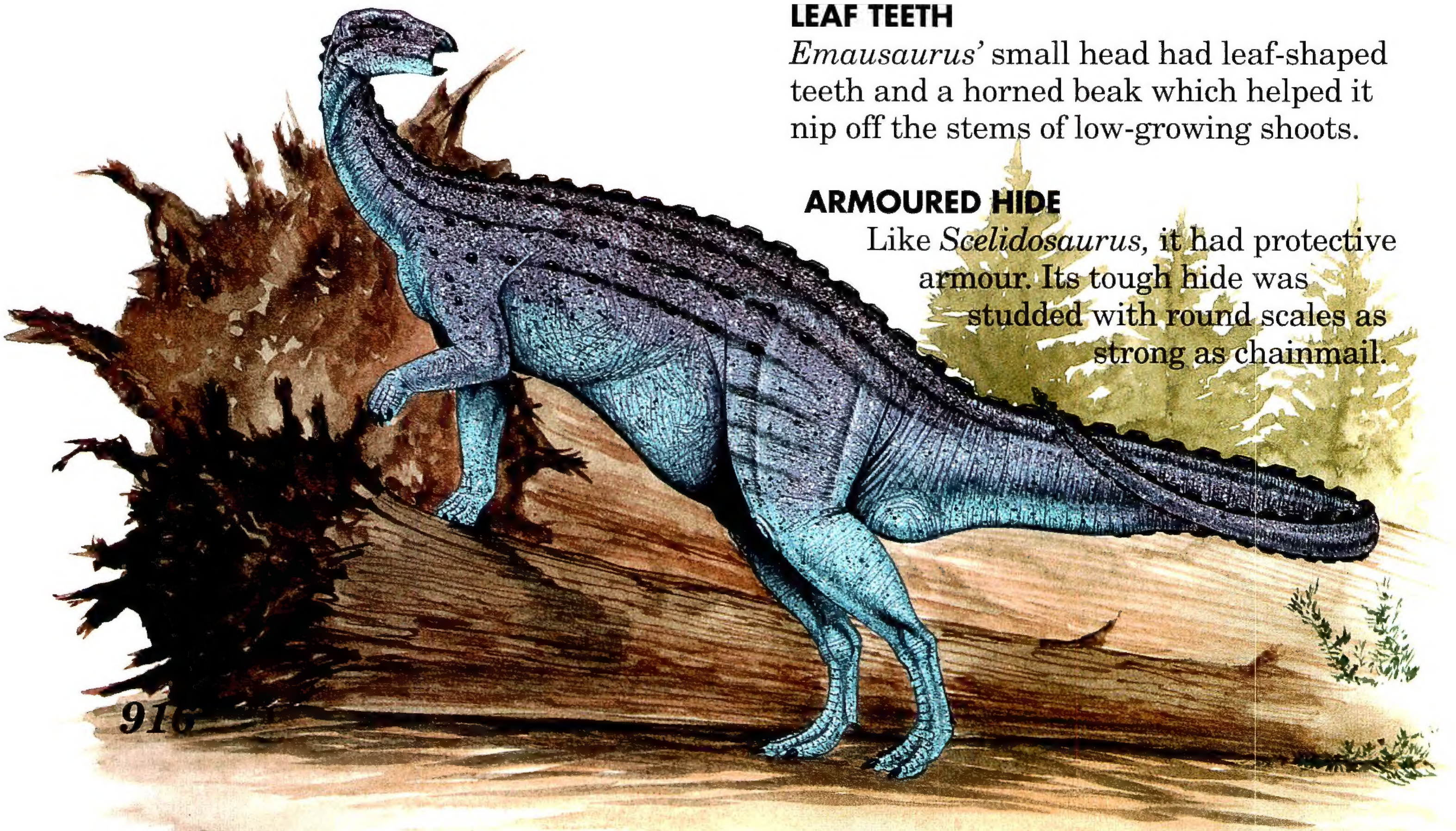
- **NAME:** *Emausaurus* (em-oh-saw-rus), the initials of the university that helped to find it. **SIZE:** about 2m long
- **FOOD:** plants
- **LIVED:** about 190 million years ago in the Early Jurassic Period in northern Germany

LEAF TEETH

Emausaurus' small head had leaf-shaped teeth and a horned beak which helped it nip off the stems of low-growing shoots.

ARMOURED HIDE

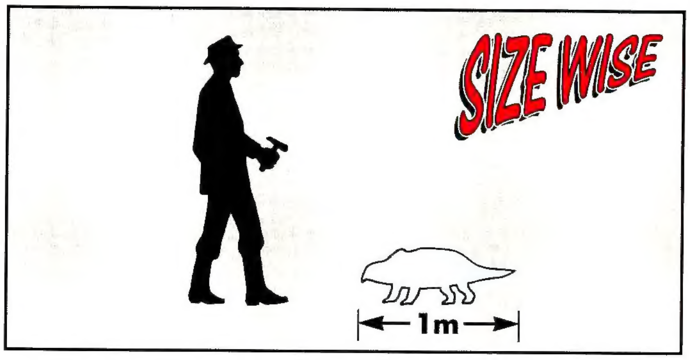
Like *Scelidosaurus*, it had protective armour. Its tough hide was studded with round scales as strong as chainmail.



BAGACERATOPS

Shorter than the knee height of an adult human, little *Bagaceratops* was about the size of a puppy.

All we know about *Bagaceratops* comes from the discovery of their skulls in Mongolia. Some were as small as your little finger and the biggest were as long as this page.



MONSTER FACTS

- **NAME:** *Bagaceratops* (bag-a-ser-a-tops) means 'small horned face'
- **SIZE:** about 1m long
- **FOOD:** plants
- **LIVED:** about 75 million years ago in the Late Cretaceous Period in Mongolia

SMALL FRILL

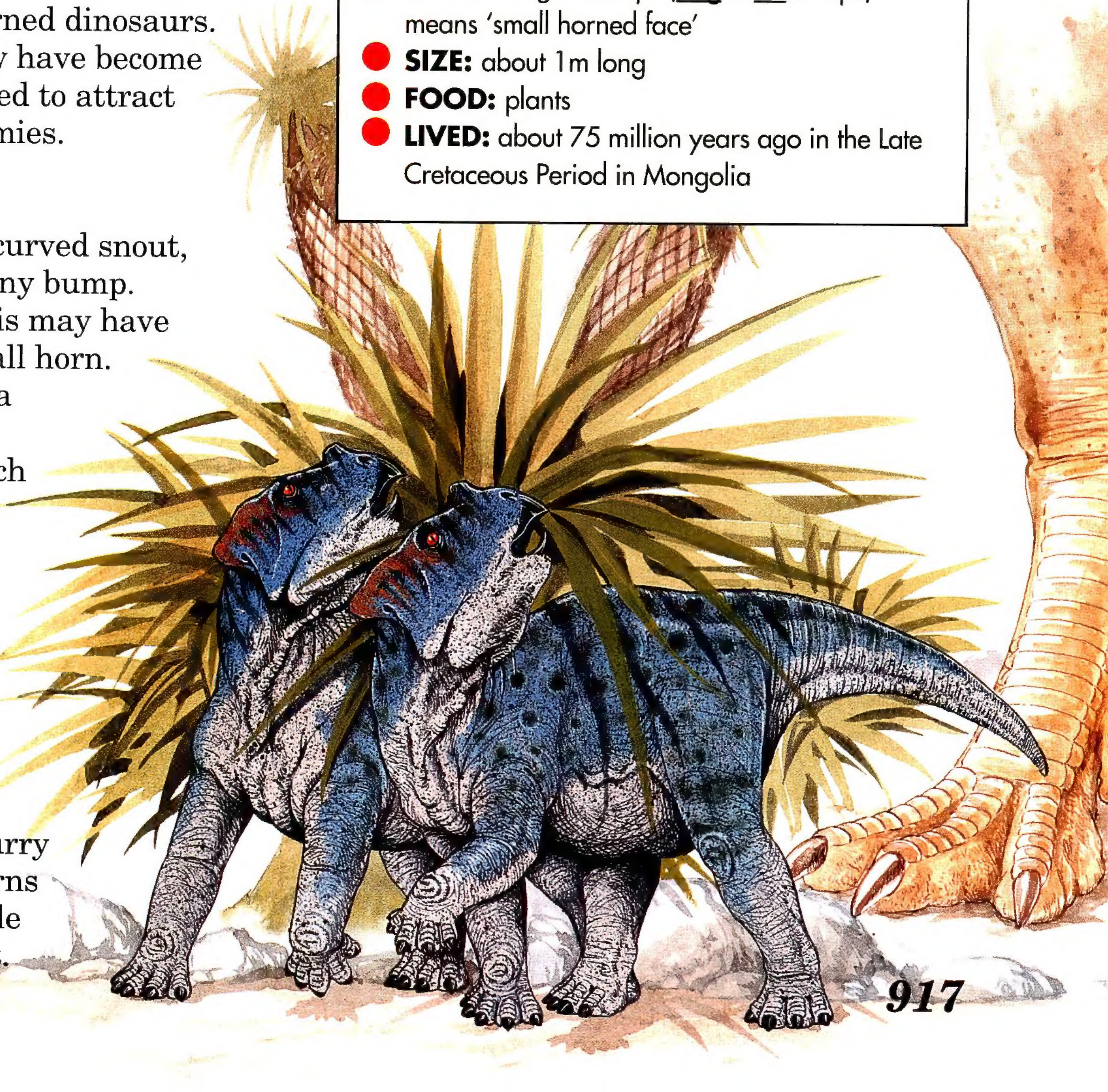
Bagaceratops had a low neck frill of solid bone. It was much shorter than the frills of some other horned dinosaurs. *Bagaceratops'* frill may have become coloured when it wanted to attract mates or warn off enemies.

BONY BUMP

At the top of its deep, curved snout, *Bagaceratops* had a bony bump. Some experts think this may have been attached to a small horn. This made it look like a little rhinoceros as it trundled along in search of juicy plants.

HIDE AND SEEK

If it found itself staring at the feet of a large predator, *Bagaceratops* probably found its small size an advantage. It could scurry among overhanging ferns and move its squat little body safely out of sight.



Island dinosaurs

Life on an island can be very different from life on the mainland. And island dinosaurs were different too.

Animals living on islands today may have difficult lives. There may be a shortage of water or food, lots of competitors for things to eat and places to shelter, danger from violent storms and tidal waves, and nowhere to run from lurking predators.

ISLAND PARADISE

On the other hand, there may be masses of food and water, and few competitors or predators. It all depends. Millions of years ago, island dinosaurs faced similar problems and opportunities.

Telmatosaurus **3.5m**

Telmatosaurus **was a duckbill similar to** ***Anatotitan.*** **But Transylvanian** ***Telmatosaurus*** **measured only 3.5m in length compared with** ***Anatotitan,*** **which measured 12m from nose to tail.**

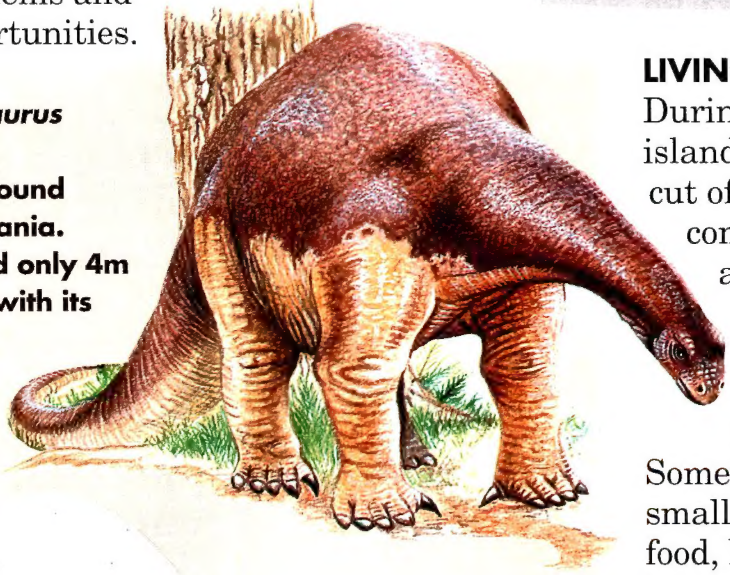
The grey rock of Sibisel Valley in Romania (left). This is where Franz Nopcsa discovered some tiny dinosaurs early this century.

LIVING ON AN ISLAND

During the Age of the Dinosaurs, many islands were formed. Some animals were cut off from their own kind, predators and competitors. When conditions change, animals evolve to cope with them. This happens on islands today and it happened to dinosaurs long ago.

SMALL SURVIVORS

Sometimes animals living on islands get smaller. In a limited area, with restricted food, lots of small animals may survive better than a few big ones. Fossils of pygmy elephants the size of a big pig have been found on several islands.



Magyarosaurus **was a tiny sauropod found in Transylvania. It measured only 4m compared with its mainland cousin's 21m.**

Magyarosaurus **4m**

TINY FOSSILS

In the early 1900s fossil-hunter Baron Franz Nopcsa discovered dinosaur bones on his estate in Transylvania, in present-day Romania. There were different types of dinosaur. But they were all tiny!

MINI-DINOS

Nodosaurs were plant-eaters with lumps and spines on their backs. Most were 4–6m long. But *Struthiosaurus* from Romania was only 2m from nose to tail. It lived at the end of the Cretaceous, when most of its larger cousins had died out.

SMALL SAUROPOD

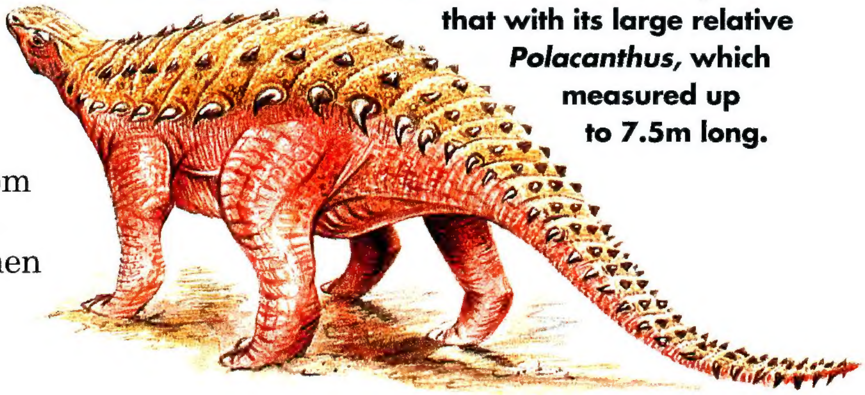
Sauropods could be over 20m long. But *Magyarosaurus* from Transylvania measured only a few metres. And like *Struthiosaurus,* it lived long after most of its giant relatives had disappeared.

What is? AN ISLAND

An island is an area of land surrounded by water. Some are very tiny. Britain is an island. So is Iceland. But what about Australia? This landmass is sometimes called the world's largest island – or the smallest continent! Islands vary in climate and landscape. Some are warm and sunny, covered in trees and rich wildlife. Some are hot and dry, with little life. Others are cold, windy and rocky.

Animals today also vary greatly in size – this tiny frog can sit on a petal.

***Struthiosaurus,* the nodosaur from Romania, measured only 2m from nose to tail. Compare that with its large relative *Polacanthus,* which measured up to 7.5m long.**



MORE MINIATURES

The Romanian fossils of *Mochlodon* looked very similar to the plant-eating ornithopod *Iguanodon,* but again, they were in miniature. And from 60 million years later! There were also the plant-eating duckbills. Most were 10m or longer. Far smaller, and one of the few duckbills from Europe, was another Transylvanian find, *Telmatosaurus.*

The pygmy marmoset is the world's smallest monkey, weighing only 85g.

AN ISLAND HOME

Why had these mini-dinos evolved? During the late Cretaceous, the continents were close to their present-day positions. But much of Europe and north-west Asia was covered by sea, forming many islands. The Romanian dinosaurs probably lived on one such island, separated from their kin for millions of years. So they evolved in unique island surroundings.

TROUBLE-FREE LIFE

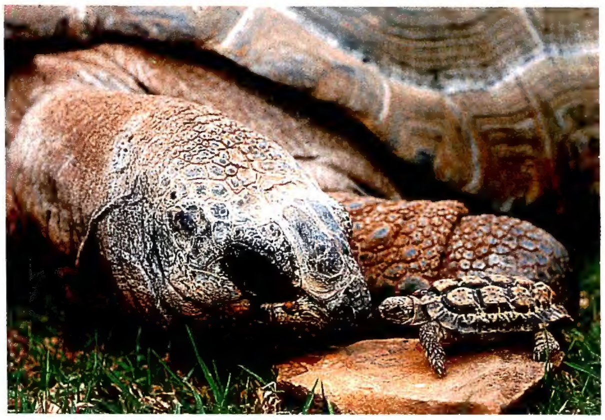
Living on an island can protect a species from problems such as disease, predators or competitors, that threaten relatives on the mainland. This may have happened to *Dravidosaurus,* a stegosaur from India.

SEPARATE FROM COMPETITORS

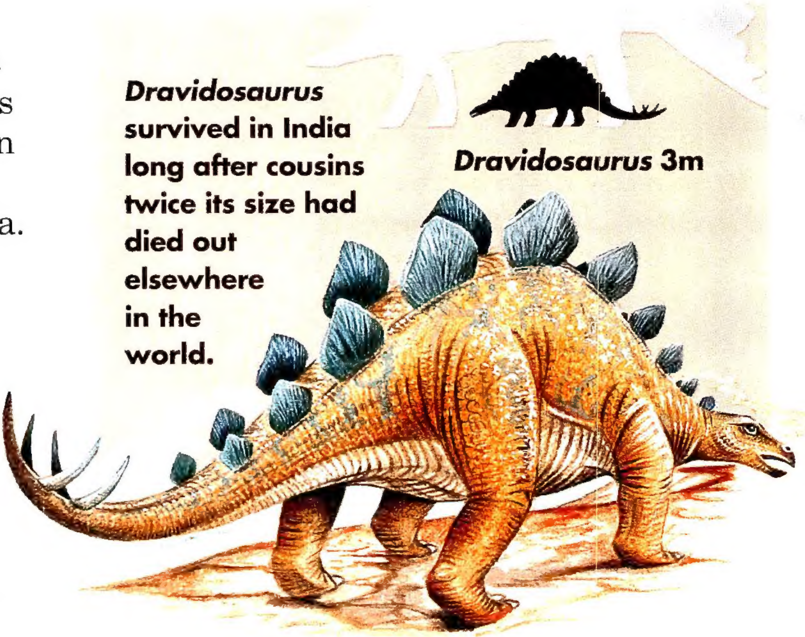
Stegosaurs first appeared in the Jurassic Period, when India was joined to Africa. They became extinct almost everywhere by the middle of the Cretaceous Period. Perhaps they were ousted by up-and-coming competitors, the armoured ankylosaurs. As India separated into an island and drifted away, it carried no ankylosaurs. So *Dravidosaurus* survived there, as the last stegosaur. It lived right to the end of the Age of the Dinosaurs, 50 million years after its cousins perished.

BUT NOT FROM PREDATORS

India was not a complete paradise, though. *Dravidosaurus* still had its enemies. *Indosuchus,* the 'Indian crocodile', was a ferocious tyrannosaur that lived at the same time. Another Indian meat-eater from the Cretaceous, though much smaller, was two-legged *Jubbulpuria.*



The world's largest tortoise next to the world's smallest. Both live in South Africa.



Dravidosaurus survived in India long after cousins twice its size had died out elsewhere in the world.

Is it true that evolution is faster on islands?

Usually, yes. Evolution is the gradual change of living things over time. Generally, it is slow. But on a new island with new conditions, when a small number of plants or animals arrive, strange things happen. There are many opportunities for evolution. It can speed up, producing new species in a short time. Pygmy species of normally large animals or giant species of normally small creatures may appear. Scientists learn about evolution by studying animals and plants on islands such as Madagascar, Hawaii and the Caribbean.

A JOINT ANCESTOR

Fossils often show how islands moved over millions of years, and how animals spread. *Barapasaurus* was an early Jurassic sauropod that was very common in India, after this landmass became an island. A very similar dinosaur, *Vulcanodon,* lived at the same time in South Africa. *Vulcanodon* and *Barapasaurus* may have evolved from the same ancestor, which lived when India was still joined to Africa.

DOWN-UNDER DINOSAURS

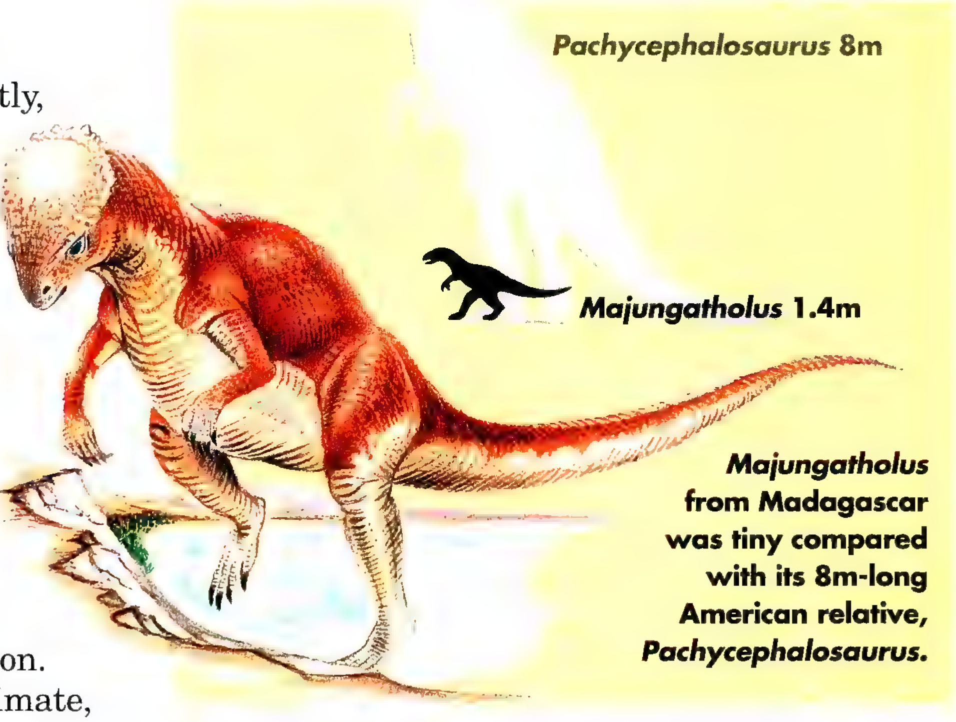
Today's biggest island (or smallest continent) is Australia. Until recently, few dinosaur fossils had been found. New finds have changed ideas about how dinosaurs evolved and where they lived.

AUSSIE ALLOSAURUS

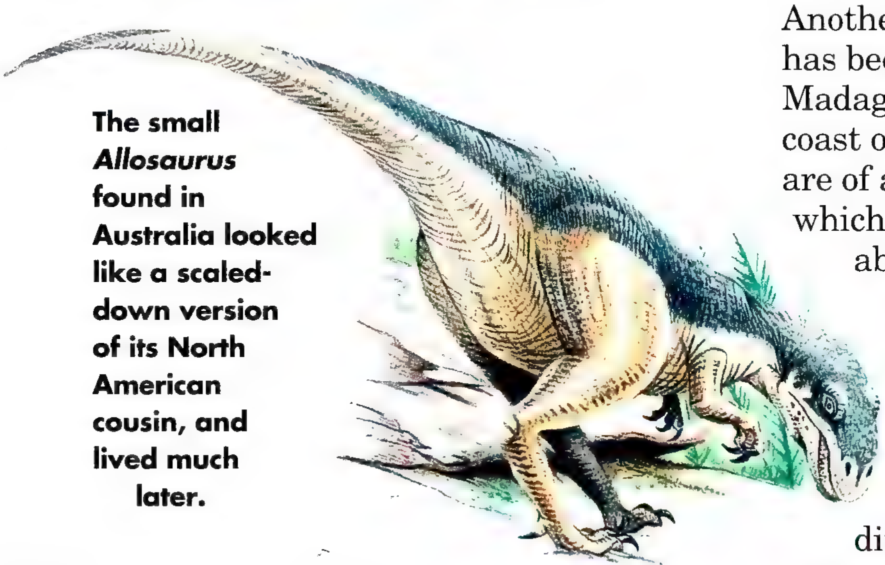
One Australian find is a two-legged meat-eater, a type of *Allosaurus*. It was similar to its famous 12m-long namesake from North America. Yet it was very much smaller, and survived for 20 million years longer. Its size may have been due to island isolation. Or it could be the result of a cold climate, as parts of Australia were inside the Antarctic Circle at the time.

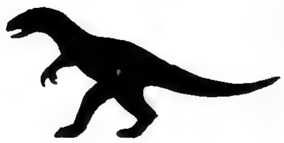
PROTOCERATOPIANS TOO

Protoceratopians were the predecessors, and perhaps ancestors, of the horned dinosaurs such as *Triceratops*. Their fossils from 80–90 million years ago have been found in North America and Asia.



***Majungatholus* from Madagascar was tiny compared with its 8m-long American relative, *Pachycephalosaurus*.**


The small *Allosaurus* found in Australia looked like a scaled-down version of its North American cousin, and lived much later.


Australian *Allosaurus* 3–4m

PROTO-SHEEP

Now Australia has a protoceratopian too. No bigger than a sheep, it lived 25 million years before its North American look-alike, *Leptoceratops*.

Tiny creatures still live in Madagascar, like this chameleo

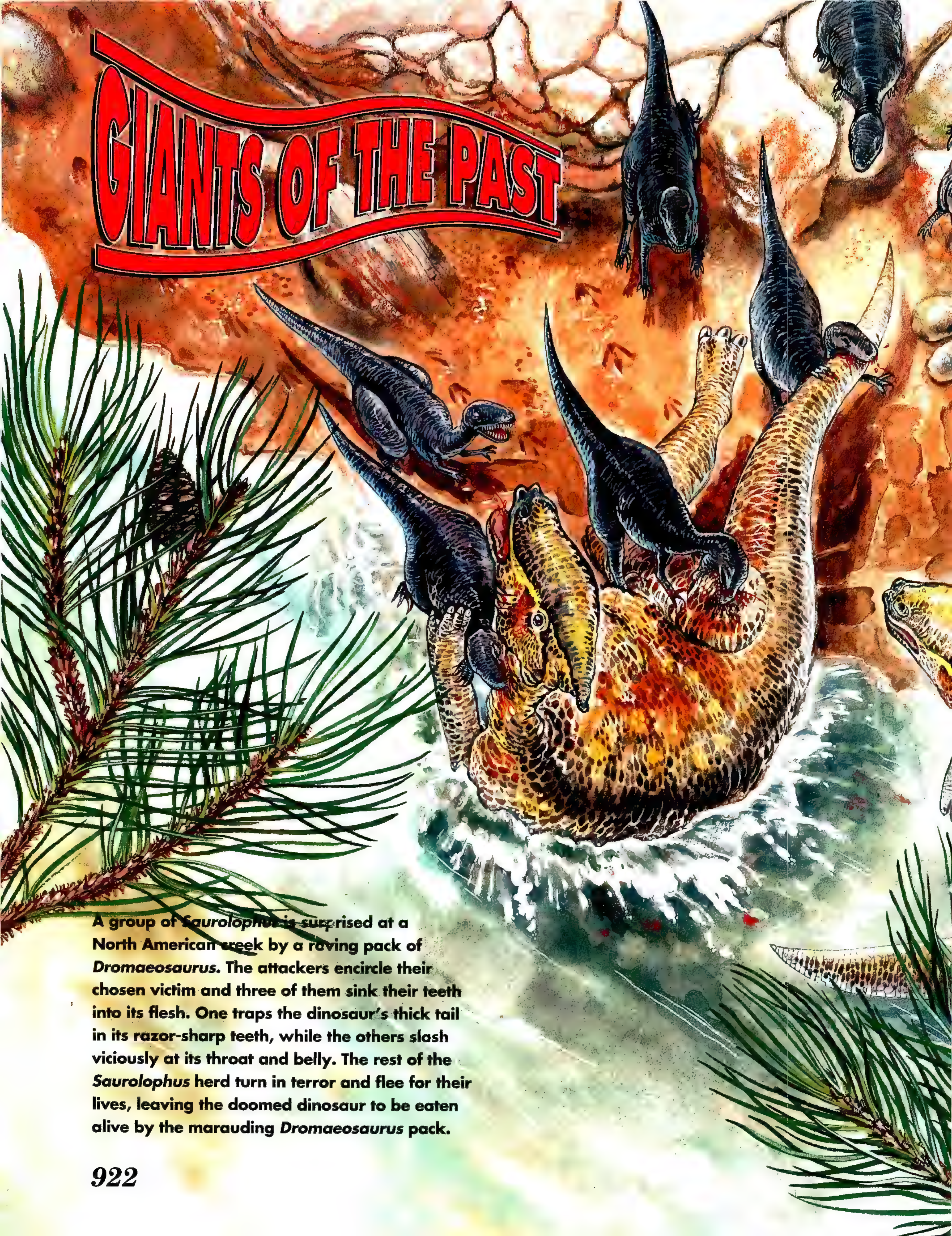
BONE-HEAD

Another island dinosaur has been found in Madagascar, off the east coast of Africa. The fossils are of a pachycephalosaur which is only 1.4m long, about one-sixth of the size of its American cousin *Pachycephalosaurus*.

RIGHT PLACE

Many places with rocks from the Age of the Dinosaurs yield dinosaur fossils – when expeditions look in the right places. Island dinosaurs continue to give us vital information about how dinosaurs appeared, and spread, and evolved and died out.

GIANTS OF THE PAST



A group of *Saurolophus* is surprised at a North American creek by a raving pack of *Dromaeosaurus.* The attackers encircle their chosen victim and three of them sink their teeth into its flesh. One traps the dinosaur's thick tail in its razor-sharp teeth, while the others slash viciously at its throat and belly. The rest of the *Saurolophus* herd turn in terror and flee for their lives, leaving the doomed dinosaur to be eaten alive by the marauding *Dromaeosaurus* pack.

DROMAEOSAURUS

3-D Gallery

UTAHRAPTOR V DEINONYCHUS

A *Deinonychus* pack has brought down and killed a young sauropod, but there are unwelcome guests at the feast! Two *Utahraptors* have seized the chance of a free meal, chasing off or toppling their smaller, fleet-footed rivals.

In disguise

Dinosaurs were probably camouflaged just like modern animals. But why did they need to be, and what would they have looked like?

No-one knows what colour dinosaurs were. Only a few fragments of fossilized dinosaur skin exist and the colour in these disappeared millions of years ago.

HIDE AND SEEK

Dinosaurs probably spent more time hiding from one another than fighting. They needed to blend in with their surroundings, to avoid a predator, or to sneak up on unsuspecting prey.

SPOTS, STRIPES AND BLOTCHES

Dinosaurs may have been patterned to fit their habitat. So hadrosaurs could have been dappled like deer today to reflect the spots of sunlight among the plants in which they fed. Or perhaps some were spotted like leopards or striped like tigers. Young animals today often have different markings from their parents because they are nearer to the ground. Wild boar piglets have stripy coats to conceal them in the broken light of the woodlands.

Segnosaurus' skin markings may have made it hard to spot when the sun shone through the trees.

Can you spot what's hiding in the grass? This tiger's markings blend so well with the long dry grass that it is perfectly hidden from prey until the moment it pounces.

Above: these fallow deer are beautifully camouflaged as they drink in woodland shade. Right: when this zebra herd moves around, their stripes blend and merge, which helps to confuse predators who want to pick out a single victim.

CHANGING COLOUR

Like chameleons today, some dinosaurs may have been able to change colour. If they fed in marshy, green lowland, but also spent time in dry, sandy upland they may have changed colour to suit each of these places. Small herbivores such as *Hypsilophodon* could probably change colour and blend with their surroundings, depending on where they were feeding.

Some dinosaurs may have changed colour as easily as a chameleon.

CONFUSING COLOURS

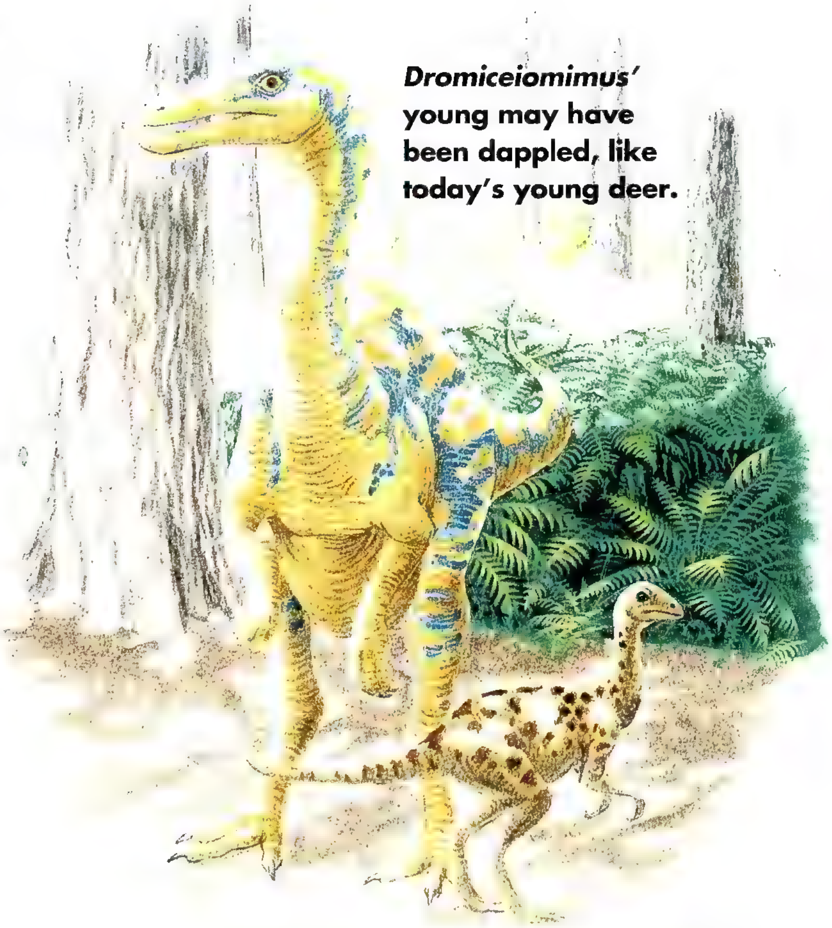
If they lived on open plains some dinosaurs may have had colours and patterns to confuse their enemies. Imagine how difficult it must be for a lion to focus on just one zebra in a whole herd. All those stripes are very confusing. Some dinosaurs probably had stripes for the same reason.

DARK AND LIGHT

Other dinosaurs may have had dark backs and pale bellies, like many antelopes today. This countershading helps to break up the animal's body shape when it is seen from a distance.

WELL DISGUISED

This mixture of dark and light colouring acts as camouflage in different places. In bright sunlight on a plain, a predator would not be able to see its pale belly. In a shady forest, the predator might glimpse its prey's belly as it fled, but would not see the whole shape.



***Dromiceiomimus'* young may have been dappled, like today's young deer.**

Mass deaths

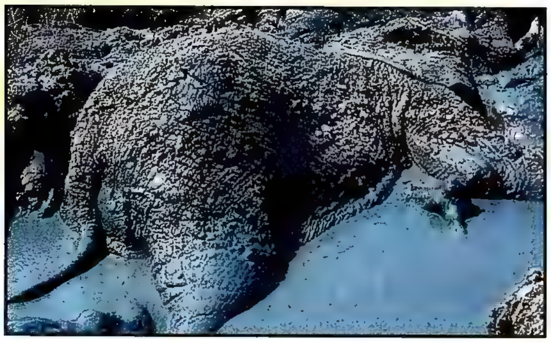
The bones of hundreds of dinosaurs that died together have been found in mass graves millions of years later.

Fossils of many dinosaurs have been found buried together. They appear to have died at the same time. But why? Experts believe they died in natural disasters such as flash floods or volcanic eruptions.

MIGRATION MADNESS

The dinosaur victims may have belonged to giant herds. Today large numbers of animals join together to form such herds. They then travel long distances to find new grazing grounds. Up to a million African wildebeest may migrate at once. In North America caribou also migrate to find food. Some do not survive the journey. For the dinosaurs, too, mass migrations were often journeys of no return.

This young elephant strayed into a pool of sticky mud, just as dinosaurs did millions of years ago.



Caribou in North America live in herds of 20,000 or more. Twice a year they travel more than 1,000km to new feeding grounds.

BREEDING FEVER

Hunger is not the only driving force behind mass migrations. Many modern creatures travel long distances to their breeding grounds. Arctic terns fly half-way across the world to nest on Arctic coasts. Frogs journey overland to lay their eggs in the ponds and streams where they were born.

MAIASAURA MIGRATION

Millions of years ago, dinosaurs such as *Maiasaura* probably behaved in the same way, making the long mass trek from their grazing grounds back to their nesting sites to lay their eggs in the breeding season.

MUDDY GRAVE

Natural disasters caused the deaths of many members of dinosaur herds. Fossil bones found at Howe Quarry in Wyoming, USA, record one of the most unusual catastrophes. The bones belong to a herd of mighty plant-eating sauropods which was probably plodding across mud flats in search of fresh pastures.

A STICKY END

Some dinosaurs must have strayed into soft, sticky mud and got stuck. Dragged down by their great weight, the sauropods were unable to pull themselves free. They probably died from exhaustion and thirst. Modern elephants are known to have died in the same way, when they trap themselves in deep mud.

MASS OF BONES

The bones of more than 40 huge *Allosaurus* were discovered in a mass grave in Utah, USA. This exciting find provided fresh evidence that meat-eaters hunted in groups. Both adults and youngsters were dug up. But their bones were scattered.

DEADLY MUD

Experts believe the *Allosaurus* may have run through a swamp while chasing prey. They were sucked down to their deaths by the oozing mud. Much later, their bones were swept away by water which flowed over the bog and scattered them about.

Several *Allosaurus* (below) venture into a swamp where an *Apatosaurus* is bogged down, sensing easy prey. But soon they too are sucked down into the lethal mud.

TIME DETECTIVE

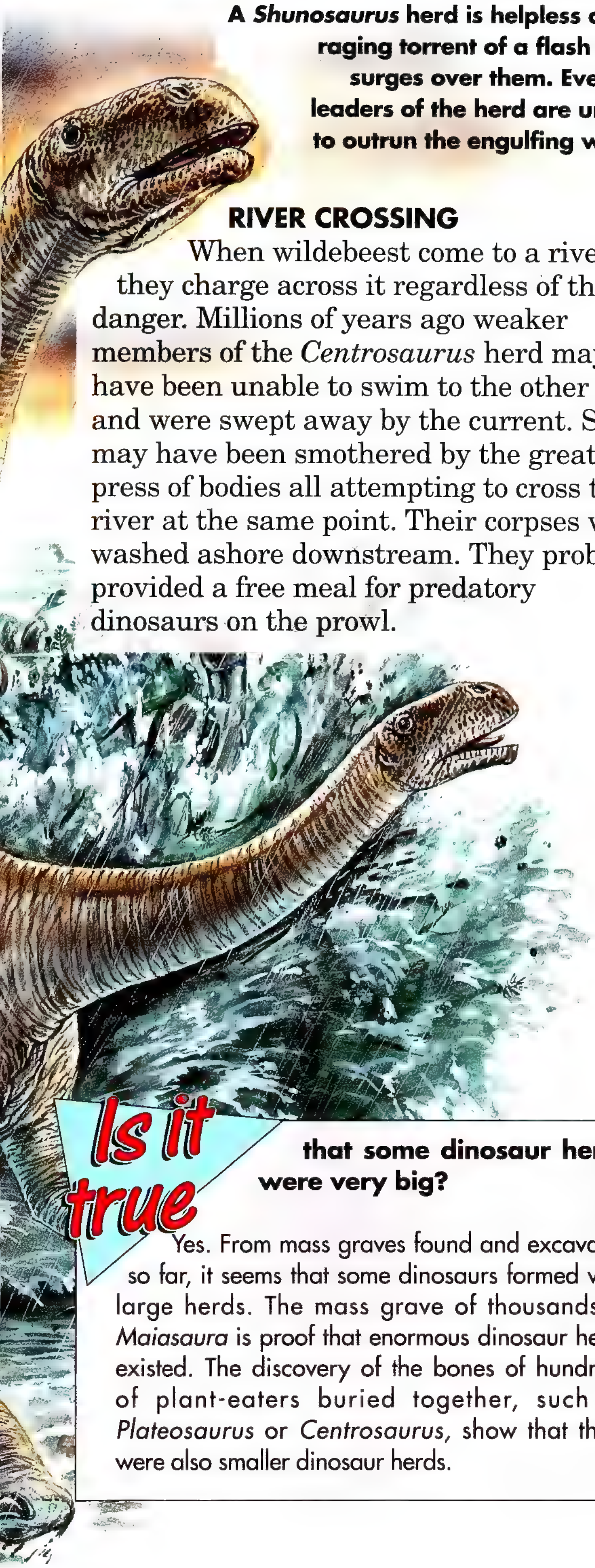
Wildebeest make mighty columns that stretch many kilometres. Driven by hunger, they cross dangerous swamps and ford deep rivers. Many perish in the attempt.

FLASH FLOODS

Violent storms followed by torrential rain can cause sudden floods. Many dinosaurs drowned when swollen rivers burst their banks and swept across valleys. Hundreds of plant-eating *Plateosaurus* died together when they were caught in a flash flood. Their bones were discovered in a mass grave in Germany. Members of a herd of *Shunosaurus* were drowned when a wall of water rushed into a ravine they were crossing after a rainstorm. More than 100 skeletons of other dinosaurs were discovered at the same site in China. Many of them probably perished in the same flash flood.

SWEPT AWAY

One of the biggest mass dinosaur graves was found in Alberta, Canada. It contained the bones of more than 300 *Centrosaurus*. Scientists think that the large plant-eaters may have drowned while trying to ford a deep river. Like modern wildebeest, they were driven on by hunger, crossing many dangerous rivers and swamps.



A *Shunosaurus* herd is helpless as the raging torrent of a flash flood surges over them. Even the leaders of the herd are unable to outrun the engulfing water.

RIVER CROSSING

When wildebeest come to a river, they charge across it regardless of the danger. Millions of years ago weaker members of the *Centrosaurus* herd may have been unable to swim to the other side and were swept away by the current. Some may have been smothered by the great press of bodies all attempting to cross the river at the same point. Their corpses were washed ashore downstream. They probably provided a free meal for predatory dinosaurs on the prowl.

Is it true that some dinosaur herds were very big?

Yes. From mass graves found and excavated so far, it seems that some dinosaurs formed very large herds. The mass grave of thousands of *Maiasaura* is proof that enormous dinosaur herds existed. The discovery of the bones of hundreds of plant-eaters buried together, such as *Plateosaurus* or *Centrosaurus*, show that there were also smaller dinosaur herds.

FIRE AND WATER

Dinosaur experts excavating in western Montana, USA, were thrilled to discover the largest mass grave ever. Buried in the rock were the fossilized bones of as many as 10,000 *Maiasaura*. It seems that the dinosaurs must have belonged to one vast herd. But why did so many die at once?

MASSIVE ERUPTION

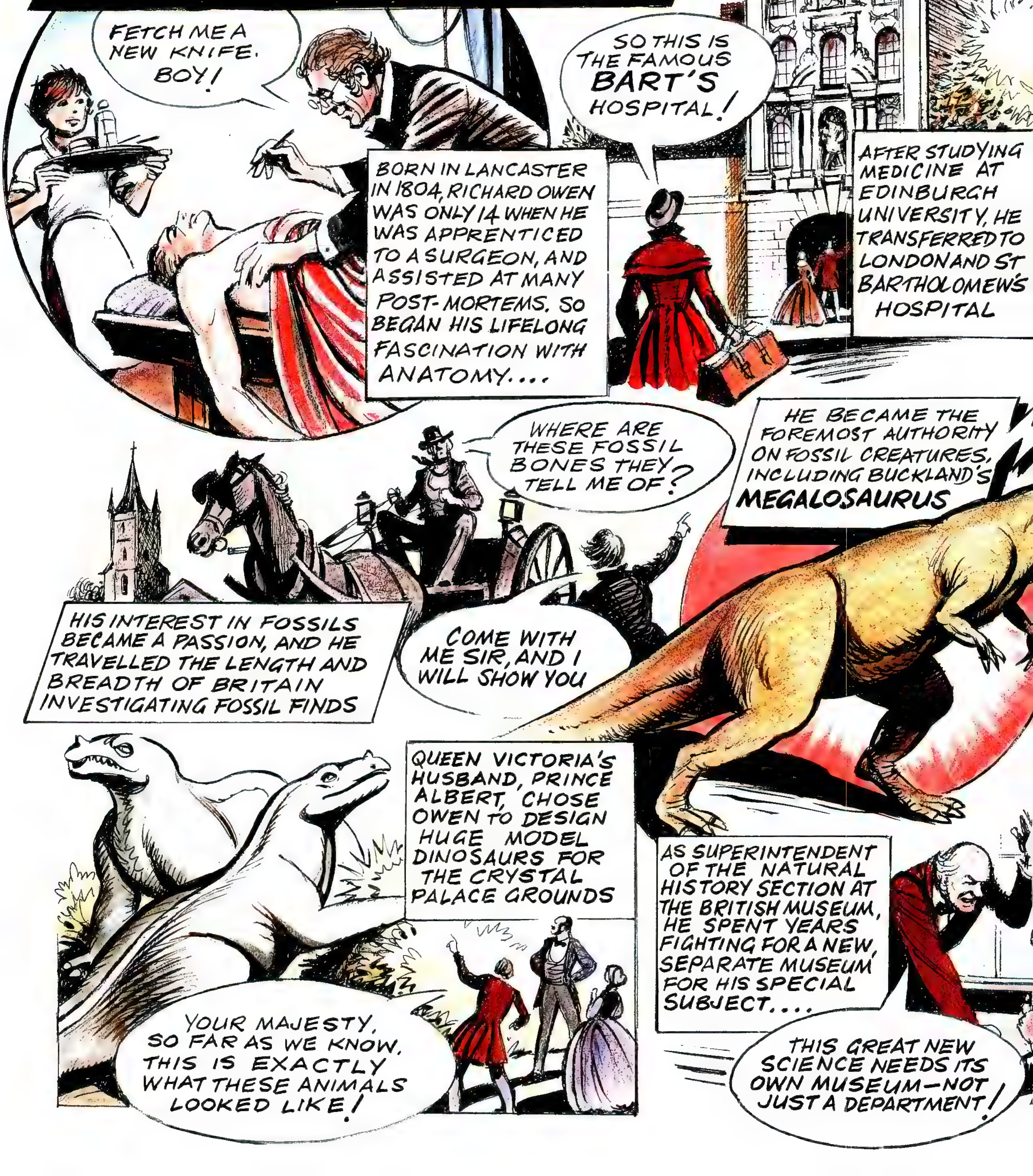
Scientists have discovered vital clues to help solve the mystery. They think the peaceful plant-eaters were wiped out by a violent volcanic eruption. They were probably killed in a red-hot rainstorm of burning ash. Or they may have been poisoned by deadly gases, or choked by smoke. Later, the area was probably flooded and the bones scattered.

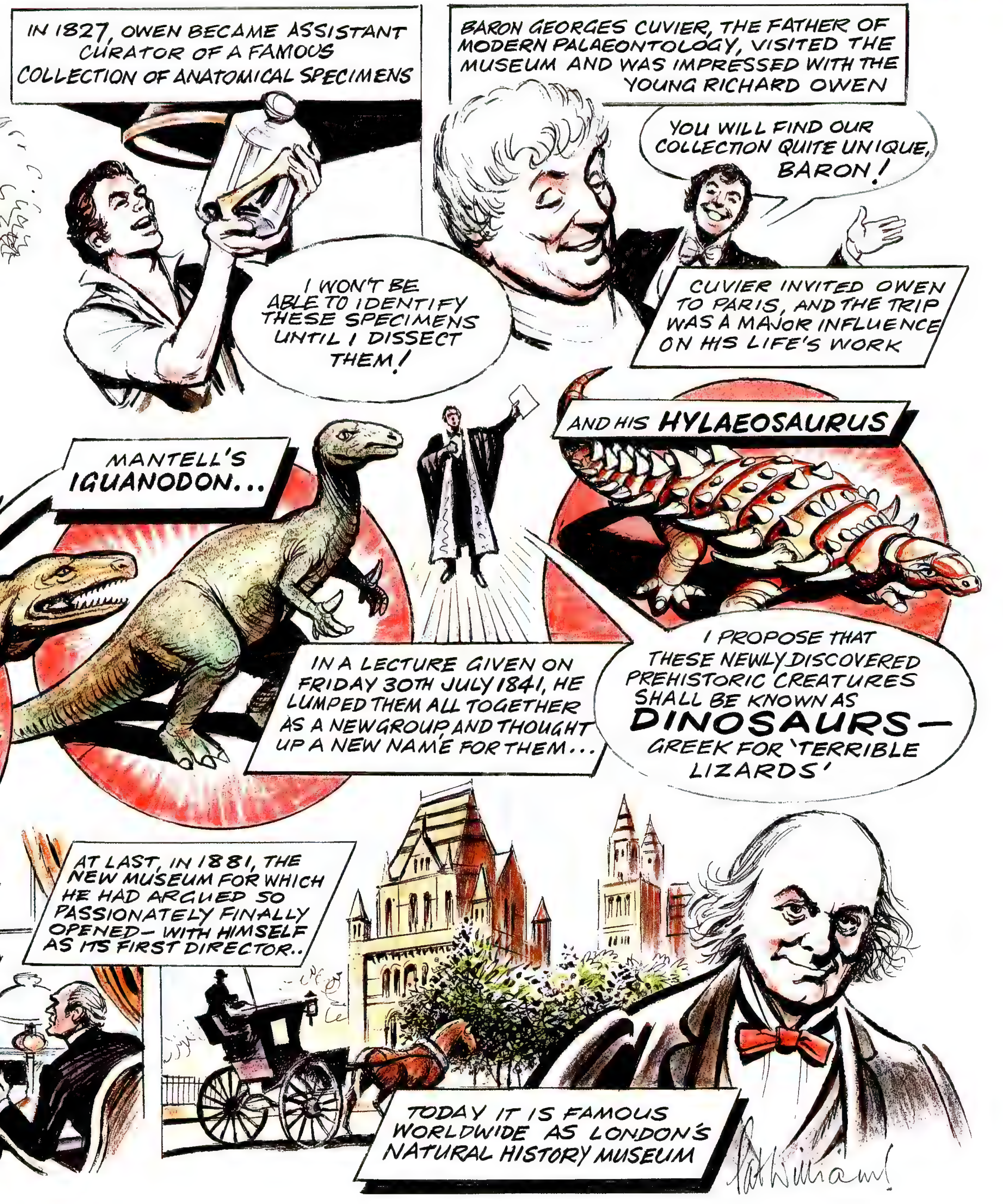
This dog died in Italy in 79 AD when Mount Vesuvius erupted and buried the town of Pompeii in red-hot lava and ash.

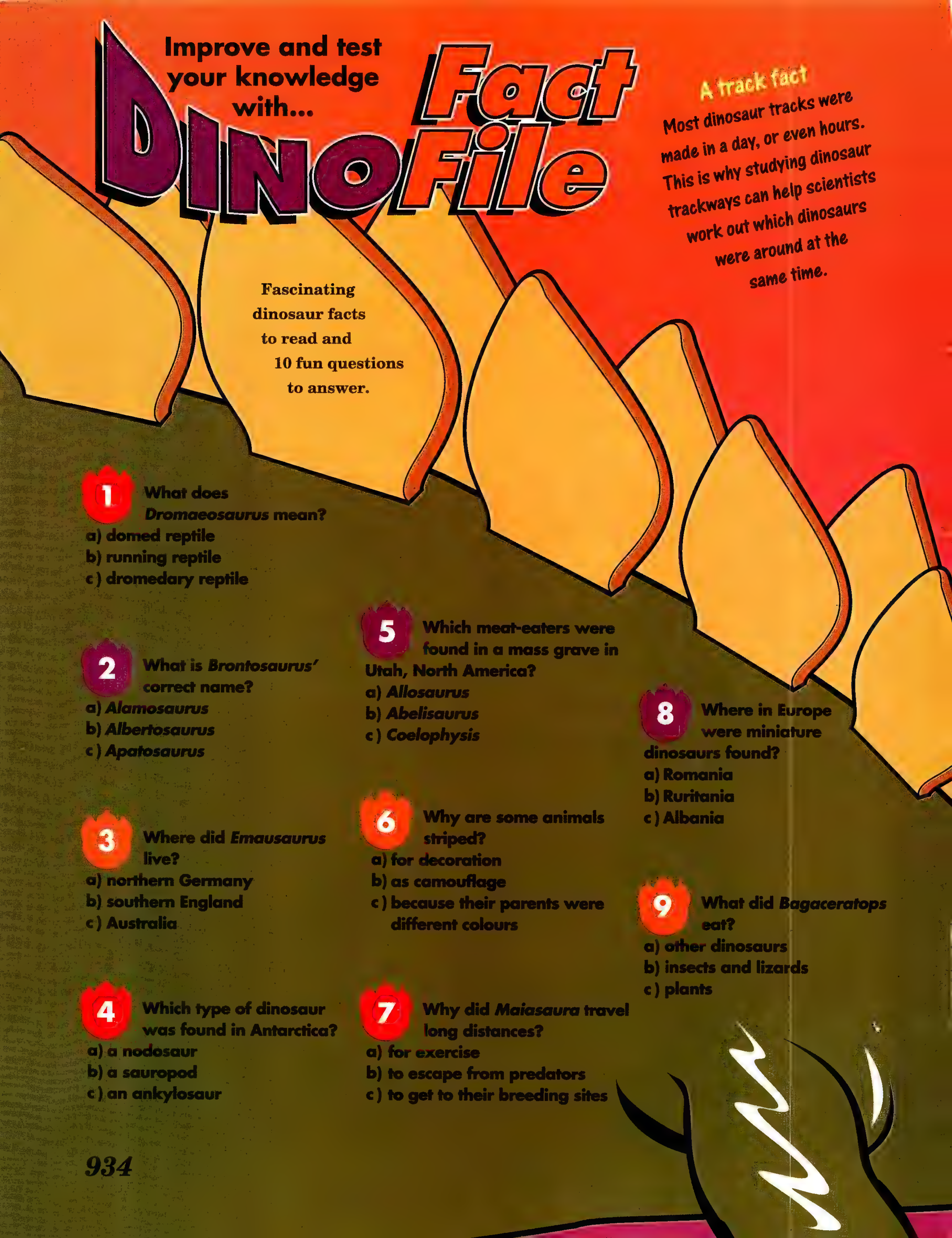
UNSOLVED MYSTERY

Many small meat-eating *Coelophysis* died together at Ghost Ranch in New Mexico. The complete skeletons of huge numbers of them have been found there buried side by side, or jumbled on top of one another. And many more await excavation. What dreadful disaster could have struck? Perhaps it was a raging bushfire, or a violent flood. They may even have been accidentally poisoned. The exact cause of this mass death remains a mystery.

THE 'TERRIBLE LIZARDS'


BORN IN LANCASTER IN 1804, RICHARD OWEN WAS ONLY 14 WHEN HE WAS APPRENTICED TO A SURGEON, AND ASSISTED AT MANY POST-MORTEMS. SO BEGAN HIS LIFELONG FASCINATION WITH ANATOMY....
FETCH ME A NEW KNIFE, BOY!
AFTER STUDYING MEDICINE AT EDINBURGH UNIVERSITY, HE TRANSFERRED TO LONDON AND ST BARTHOLOMEW'S HOSPITAL
SO THIS IS THE FAMOUS BART'S HOSPITAL!
HIS INTEREST IN FOSSILS BECAME A PASSION, AND HE TRAVELLED THE LENGTH AND BREADTH OF BRITAIN INVESTIGATING FOSSIL FINDS
WHERE ARE THESE FOSSIL BONES THEY TELL ME OF?
COME WITH ME SIR, AND I WILL SHOW YOU
HE BECAME THE FOREMOST AUTHORITY ON FOSSIL CREATURES, INCLUDING BUCKLAND'S MEGALOSAURUS
QUEEN VICTORIA'S HUSBAND, PRINCE ALBERT, CHOSE OWEN TO DESIGN HUGE MODEL DINOSAURS FOR THE CRYSTAL PALACE GROUNDS
YOUR MAJESTY, SO FAR AS WE KNOW, THIS IS EXACTLY WHAT THESE ANIMALS LOOKED LIKE!
AS SUPERINTENDENT OF THE NATURAL HISTORY SECTION AT THE BRITISH MUSEUM, HE SPENT YEARS FIGHTING FOR A NEW, SEPARATE MUSEUM FOR HIS SPECIAL SUBJECT....
THIS GREAT NEW SCIENCE NEEDS ITS OWN MUSEUM—NOT JUST A DEPARTMENT!


IN 1827, OWEN BECAME ASSISTANT CURATOR OF A FAMOUS COLLECTION OF ANATOMICAL SPECIMENS
I WON'T BE ABLE TO IDENTIFY THESE SPECIMENS UNTIL I DISSECT THEM!
BARON GEORGES CUVIER, THE FATHER OF MODERN PALAEONTOLOGY, VISITED THE MUSEUM AND WAS IMPRESSED WITH THE YOUNG RICHARD OWEN
YOU WILL FIND OUR COLLECTION QUITE UNIQUE, BARON!
CUVIER INVITED OWEN TO PARIS, AND THE TRIP WAS A MAJOR INFLUENCE ON HIS LIFE'S WORK
MANTELL'S IGUANODON...
AND HIS HYLAEOSAURUS
IN A LECTURE GIVEN ON FRIDAY 30TH JULY 1841, HE LUMPED THEM ALL TOGETHER AS A NEW GROUP, AND THOUGHT UP A NEW NAME FOR THEM...
I PROPOSE THAT THESE NEWLY DISCOVERED PREHISTORIC CREATURES SHALL BE KNOWN AS DINOSAURS — GREEK FOR 'TERRIBLE LIZARDS'
AT LAST, IN 1881, THE NEW MUSEUM FOR WHICH HE HAD ARGUED SO PASSIONATELY FINALLY OPENED — WITH HIMSELF AS ITS FIRST DIRECTOR..
TODAY IT IS FAMOUS WORLDWIDE AS LONDON'S NATURAL HISTORY MUSEUM
Pat Williams



Improve and test your knowledge with...

DINO Fact File

Fascinating dinosaur facts to read and 10 fun questions to answer.

A track fact

Most dinosaur tracks were made in a day, or even hours. This is why studying dinosaur trackways can help scientists work out which dinosaurs were around at the same time.

1 What does *Dromaeosaurus* mean?
a) domed reptile
b) running reptile
c) dromedary reptile

2 What is *Brontosaurus'* correct name?
a) *Alamosaurus*
b) *Albertosaurus*
c) *Apatosaurus*

3 Where did *Emausaurus* live?
a) northern Germany
b) southern England
c) Australia

4 Which type of dinosaur was found in Antarctica?
a) a nodosaur
b) a sauropod
c) an ankylosaur

5 Which meat-eaters were found in a mass grave in Utah, North America?
a) *Allosaurus*
b) *Abelisaurus*
c) *Coelophysis*

6 Why are some animals striped?
a) for decoration
b) as camouflage
c) because their parents were different colours

7 Why did *Maiasaura* travel long distances?
a) for exercise
b) to escape from predators
c) to get to their breeding sites

8 Where in Europe were miniature dinosaurs found?
a) Romania
b) Ruritania
c) Albania

9 What did *Bagaceratops* eat?
a) other dinosaurs
b) insects and lizards
c) plants

Growth spurt

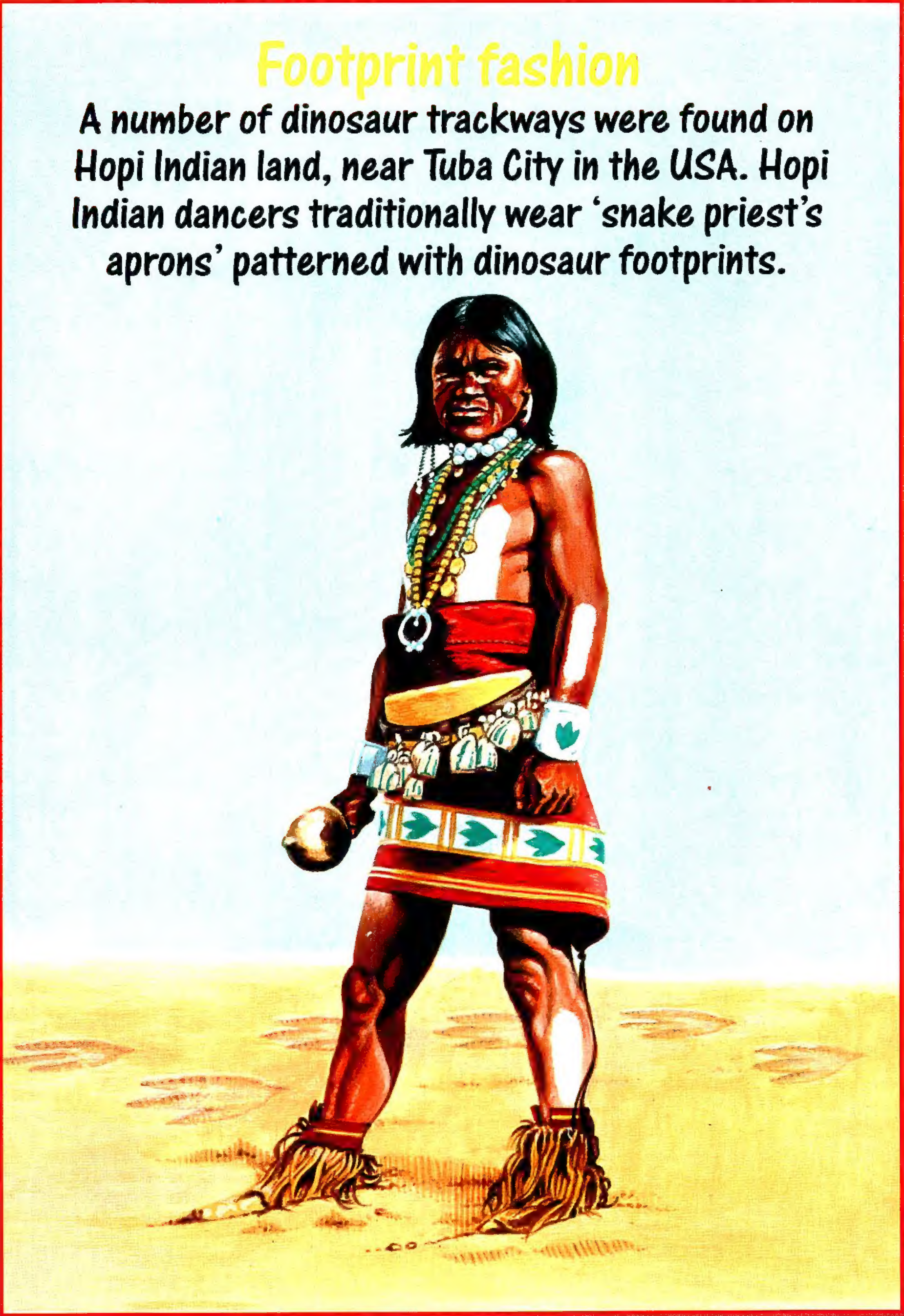
For about 160 million years during the Age of the Dinosaurs, mammals remained very small. Most of them were no bigger than a shrew. But in the 10 million years since dinosaurs died out, mammals evolved into much larger creatures, including whales and elephants!

Big feet

The largest dinosaur exhibit in the world can be found at the Tyrrell Museum of Palaeontology in Alberta, Canada. The museum also houses a large collection of dinosaur footprints from nearby Peace River in British Columbia, which were collected before the valley was permanently flooded in the 1970s.

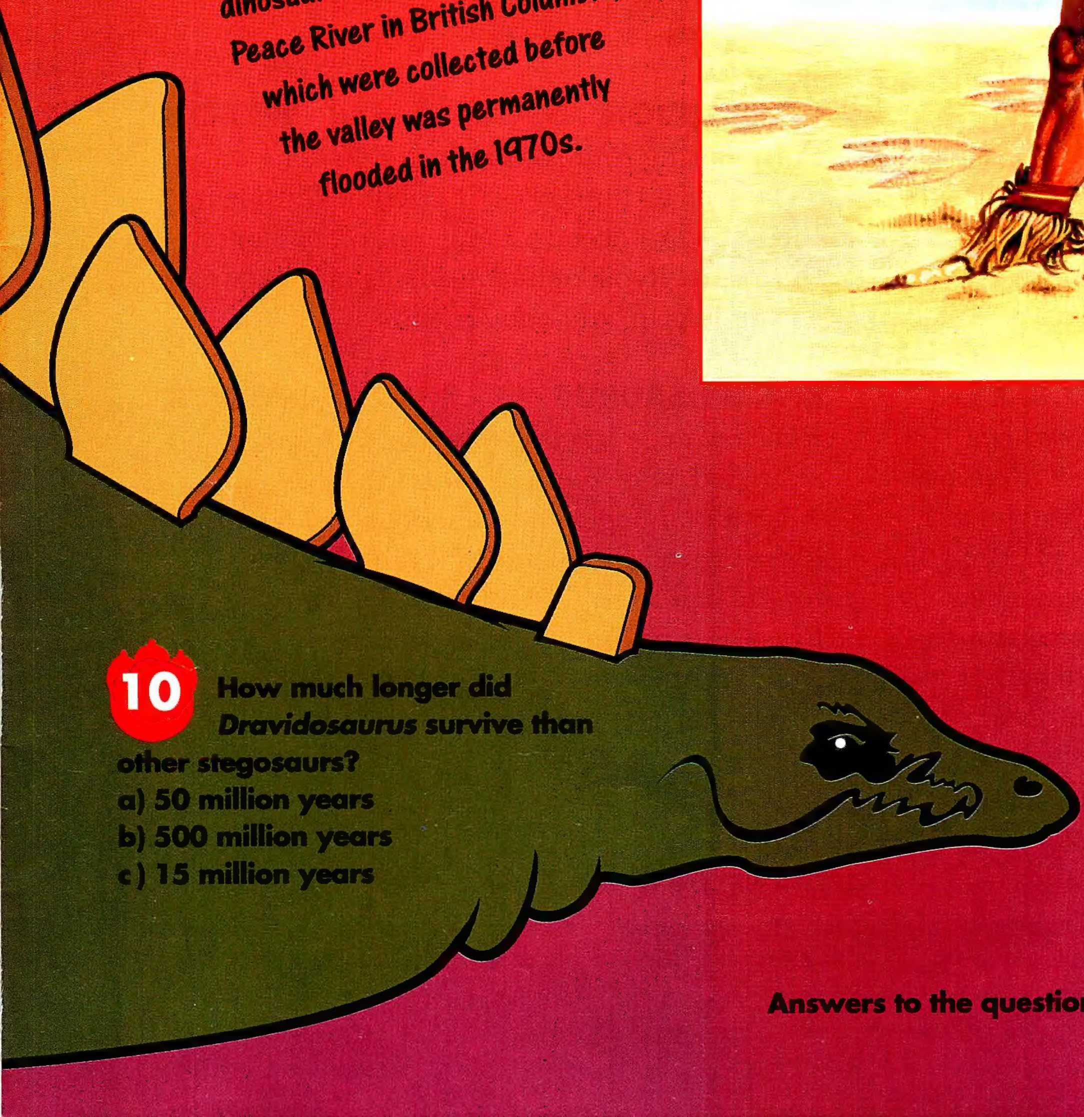
Footprint fashion

A number of dinosaur trackways were found on Hopi Indian land, near Tuba City in the USA. Hopi Indian dancers traditionally wear 'snake priest's aprons' patterned with dinosaur footprints.



Surviving the cold

In 1987 a small ankylosaur was discovered in Antarctica. It was the very first dinosaur to be found on that continent. It proves that dinosaurs could survive much colder weather than scientists once thought.



10 **How much longer did *Dravidosaurus* survive than other stegosaurs?**

a) 50 million years
b) 500 million years
c) 15 million years

Answers to the questions on inside back cover

PROTOCERATOPS 110 MYA

Protoceratops (pro-toe-ser-a-tops) is famous because its fossils were found in the Gobi Desert in Mongolia beside complete nests of their eggs. Until this discovery no-one knew for certain that dinosaurs laid eggs. Experts believe that *Protoceratops* lived in small herds because some of their nests were found very close together. It had a bony neck frill and is one of the earliest horned dinosaurs. A small plant-eater about the size of a dog, four-legged *Protoceratops* sliced through plants with its sharp, curved beak. It lived in the Late Cretaceous Period and its name means 'first horned face'.

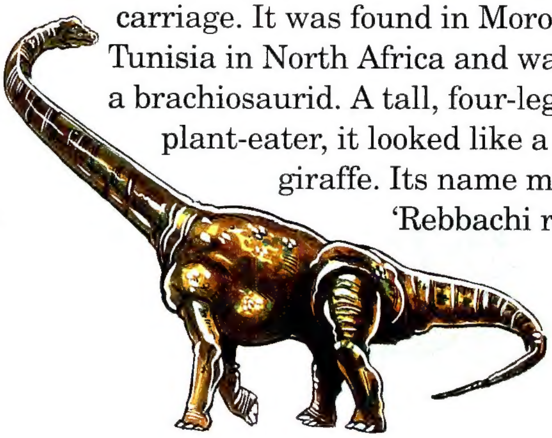
PSITTACOSAURUS 100 MYA

Although it did not have a neck frill like other horned dinosaurs *Psittacosaurus* (si-tak-oh-saw-rus) had a bone in its upper beak which is only found in ceratopians. It was discovered in the Gobi Desert, Mongolia with tiny skeletons of its newly hatched babies. A plant-eater, it swallowed stones with its powerful jaw muscles to help it digest its food. *Psittacosaurus* probably carried food to its babies until they could leave the nest. It had flexible hands with blunt claws, strong back legs and a long tail. Its name means 'parrot reptile'.

R

REBBACHISAURUS 120 MYA

Rebbachisaurus (reb-bak-i-saw-rus) was a huge dinosaur about as long as a train carriage. It was found in Morocco and Tunisia in North Africa and was probably a brachiosaurid. A tall, four-legged, plant-eater, it looked like a huge giraffe. Its name means 'Rebbachi reptile'.

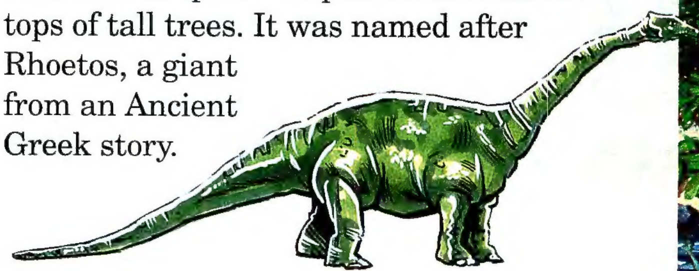


RHABDODON 80 MYA

Plant-eating *Rhabdodon* (rab-doh-don) was as long as a rhinoceros. It lived in Europe in the Late Cretaceous. Longer and heavier than most hypsilophodontids, it ran on two strong legs. *Rhabdodon* means 'rod tooth'.

RHOETOSAURUS 170 MYA

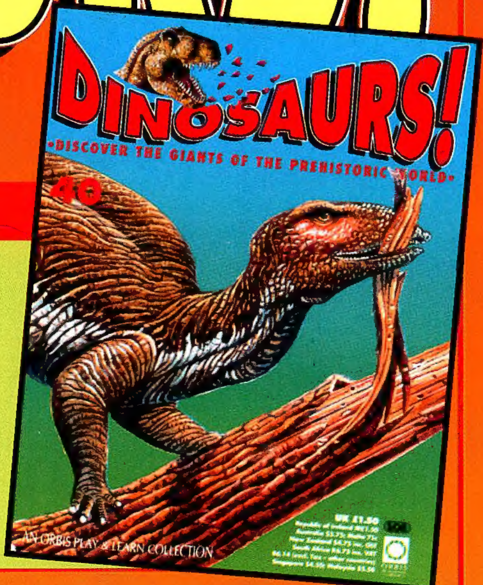
Rhoetosaurus (reet-oh-saw-rus), an early sauropod, was found in central Queensland, Australia. Longer than a lorry, it raked off leaves with spoon-shaped teeth from the tops of tall trees. It was named after Rhoetos, a giant from an Ancient Greek story.



MYA = MILLION YEARS AGO

COMING IN PART 40 OF

DINOSAURS!

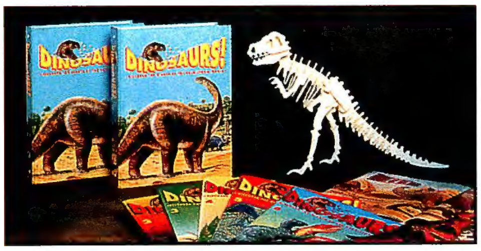

DINOSAURS!
•DISCOVER THE GIANTS OF THE PREHISTORIC WORLD•
40
AN ORBIS PLAY & LEARN COLLECTION

What did dinosaurs have for dinner? Find out in DINOSAUR WORLD. Could dinosaurs grow feathers? We investigate in TIME DETECTIVE.

PLUS

IDENTIKIT investigates the lives of three more exciting dinosaurs and GIANTS OF THE PAST SPOTTER'S GUIDE 3-D GALLERY

DINOSAURS! binders



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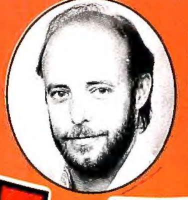
THE DINOSAURS! POSTER COLLECTION

Have you ever wanted to fill your room with dinosaurs? Now you have your chance – with the *Dinosaurs!* POSTER COLLECTION. Each poster is 820 x 570mm (nearly eight times the size of this page) and features a superb dinosaur artwork. You'll find facts and figures about the dinosaur on the back – PLUS a look at some other prehistoric animals. The eleventh poster is *Spinosaurus*.

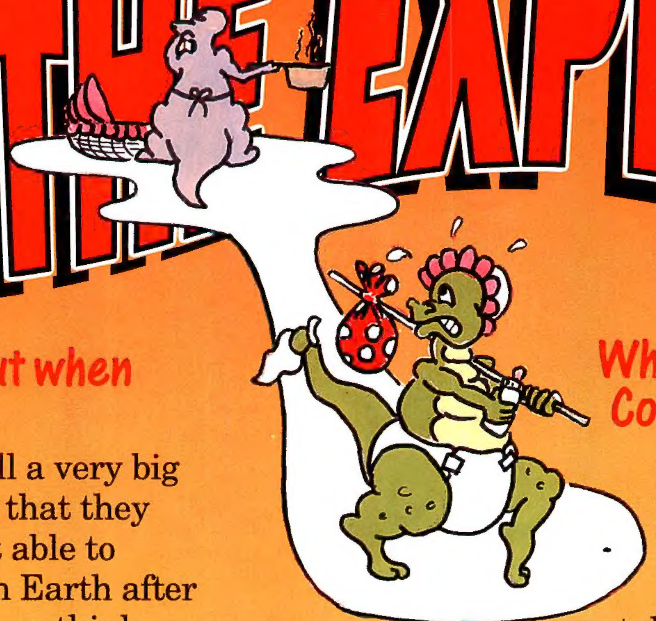
PICTURE CREDITS: front cover: Barry Croucher/Wildlife Art Agency (WLAA), Robert Harding 931 R; Natural History Museum IFC; Natural History Museum/John Sibbick 913 BR, 914 BL; NHPA 919 R, 920 BL, 926 BR, 927 TL, TR, 928 BL; David Norman 918 C; Oxford Scientific Films 930 TL, inset TL; ZEFA 919 BL, 921 CR, 927 CL, 928 TR .
Artwork: Black Hat 936 TR, CL, BR; Robin Carter/WLAA 922-3, 930-1 BKRD; Barry Croucher/WLAA FC, 915 R, 927 BR, 928-9 BKRD; Grisewood and Dempsey 915 BL, 917 T; Tony Jackson/Black Hat 935 R; Deirdre McHale: back cover; Nick Pike/WLAA 926 BL; Steve Roberts/WLAA 918 TR, BL, 919 TL, 920 TR, 921 TR, BL; Graham Rosewarne 916 B, 917 BR; Steve White 924-5; Pat Williams 932-3

ANSWERS TO DINO FACT FILE QUESTIONS: 1.b 2.c 3.a 4.c 5.a 6.b 7.c 8.a 9.c 10.a

ASK THE EXPERT



Dr. David Norman of Cambridge University answers your dinosaur questions

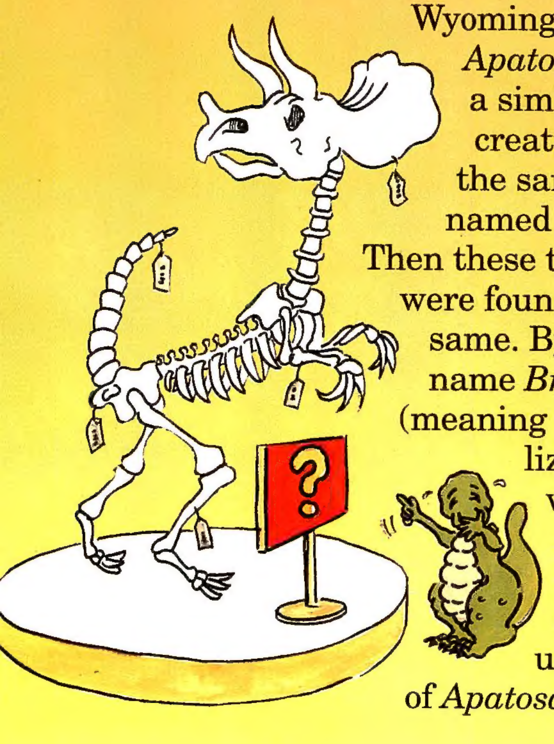


Why did dinosaurs die out when other animals did not?

Why dinosaurs died out is still a very big mystery. Some people believe that they died out because they weren't able to survive changed conditions on Earth after a huge meteorite landed. Others think that they simply died out because their bodies couldn't cope with the Earth's increasingly seasonal climate.

Do palaeontologists sometimes make mistakes or mix up dinosaurs when they find them?

Yes, mistakes have been made, usually when scientists become excited by new discoveries. In the 1870s part of a dinosaur's skeleton found in Wyoming was named *Apatosaurus*. Later a similarly-sized creature from rocks the same age was named *Brontosaurus*. Then these two dinosaurs were found to be the same. By then the name *Brontosaurus* (meaning 'thunder lizard') was widely-known and is still sometimes mistakenly used instead of *Apatosaurus*.



Why did Coelophysis eat its young?

I have no idea! But when a new male lion takes over a pride (a family group) he kills all the young cubs and fathers his own, so that only his cubs are in the pride. It is possible that some dinosaurs did the same. Another possible explanation is that these predatory dinosaurs may simply have eaten anything that moved.

How much is a dinosaur fossil worth?

Dinosaur fossils are essential pieces of evidence for scientists because they provide vital clues to the Earth's history. They are also important to museums because they attract visitors. Because they are part of our natural heritage they are priceless, and should be available in museums for everyone to enjoy.

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